Asian Journal of Advances in Agricultural Research

14(1): 17-24, 2020; Article no.AJAAR.57953
ISSN: 2456-8864

Factors Influencing Sustainable Agricultural Practices among Smallholder Farmers in Ogun State of Nigeria

Samuel Olusola Oyewole[1*] and Samson Olayemi Sennuga[2]

[1]Forestry Research Institute of Nigeria, Federal Ministry of Environment, Forest Hill, Jericho, Ibadan, Nigeria.
[2]School of Agriculture Food and Environment, Royal Agricultural University, Stroud Road, Cirencester, Gloucestershire, GL7 6JS, UK.

Authors' contributions

This work was carried out in collaboration between the authors. Author SOO designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author SOS carried out literature searches, reviewed the work and corrected the final manuscript. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJAAR/2020/v14i130120
Editor(s):
(1) Dr. Bing-Lan Liu, Chaoyang University of Technology, Taiwan.
Reviewers:
(1) Bealu Tukela Bekata, Hawassa University, Ethiopia.
(2) Judith D. Intong, Central Mindanao University, Philippines.
Complete Peer review History: http://www.sdiarticle4.com/review-history/57953

Original Research Article

Received 02 April 2020
Accepted 09 June 2020
Published 24 July 2020

ABSTRACT

The importance of adopting Sustainable Agricultural Practices (SAPs) approach to improve food production cannot be overemphasized in policy development and research agenda of many countries in sub-Saharan Africa. This study investigates how socio-demographic factors influence farm-level decision process associated with the adoption of sustainable agricultural practices among smallholder farmers in Ogun State. A multi-stage sampling technique was used to select 196 farmers. Primary data were collected with the aid of structured questionnaires. The data collected were analyzed using descriptive statistics, Likert scale rating and multivariate probit model. The results showed that majority of the farmers were male with mean age of 35 years cultivating an average farm size of 5.8 hectares. The use of improved variety was adopted by 95.41% and this was rank first among the practices adopted by the farmers. Agroforestry was rank second and adopted by 85.71% of the respondents. The extent of adoption by the respondents

**Corresponding author: Email: shola4delord@yahoo.com;*

showed that 94.39 and 72.45 were practicing the use of improved variety and agroforestry regularly. The factors influencing adoption of sustainable practices were age, education, farm size, farming experience and membership of social organization. The result further revealed that young farmers are more likely to adopt sustainable agricultural practices as option to increase productivity and reduce vulnerability of environment to ecological problems. This suggests that campaign for adoption of sustainable agricultural practices should target young farmers. However, this is not to discriminate older farmers in the sustainable agriculture policy agenda. The study established that there are complementary and substitute effects between the sustainable agricultural practices. This showed that policy changes that affect adoption of a given practice can have spillover effect on the other. Hence, extension services and promotion agenda should always emphasize the effects between different practices to enhance farmers' choice.

Keywords: Sustainable agricultural practices; smallholder farmers; multivariate probit; adoption.

1. INTRODUCTION

Agriculture is the bed rock of many developing economy in sub-Saharan Africa for example Nigeria. Agriculture is the major driver of economic growth and development. In spite of most countries' comparative advantage in food production, the state of the Agricultural sector has continued to rely on primitive methods to sustain the increasing population growth. Hence the sector is yet to reach its full potential to transform the economy and reduce socioeconomic hardship which is the major problem facing many households. The underperformance of agriculture in most of these countries has been attributed to inability to embrace sustainable approach to food production and new innovations. Agricultural development depends to a large extent on farmers' willingness and ability to make use of new technologies and innovations for the socioeconomic and well-being of the people [1].

Sustainable agricultural practices remain the viable option to boost farm productivity among small holder farmers in developing economy particularly Nigeria where the agricultural system is characterized by peasant production with customary land tenure system, low productive capacity arising from poor technology adoption and crude method of farming [2,3]. The problem of land degradation and decline productivity in rural agriculture have been attributed to poor agronomic practices age-long soil amendments method and the use of obsolete mechanical approach to soil management [2].

Sustainable agriculture is an important concept to alert farmers and it is alternative farming systems to traditional methods of farming. The methods are capable of achieving the profitability maximization objective of conventional agriculture and maintenance of ecological dynamics of agro-ecosystems and biodiversity. Consideration for sustainable agriculture practices is not only the future requirements of production increase, but to maintain the quality of environment, water and soil [4].

Achievement of sustainable food security objective depends on efficient agricultural system that will not only emphasize increased food production but embrace the practices that will reduce the vulnerability of environment to ecological problems such as soil degradation, climate change, erosion etc. Food insecurity is a threat to sustainable socioeconomic development particularly in sub Saharan African Countries. Despite the effort to combat hunger and nutrition insecurity, more than 23.2% which translate to about 236.5 million people are still under nourished in this region [5]. This therefore requires more investment and adoption of sustainable agricultural practices that will maximize farm productive resources for increased output.

The promotion of sustainable agricultural practices as option to tackle the problems that are facing agricultural development and achievement of sustainability objective has become a major issue among development planners, donor agencies, and extension workers [6]. Examples of sustainable agricultural practices include the use of improved varieties, agroforestry, integrated pest management, conservation agriculture, legume intercropping, legume crop rotations, use of animal manure, and soil and water conservation [7,8,9].

There are several efforts to promote sustainable intensification of smallholder farmers yet, there is under utilization of conservation and sustainable

agricultural practices in SSA compared to many developed countries [10,11]. This has been attributed to many factors that are influencing the adoption level. It is essential to investigate the underlying factors that affect farm-level adoption decision. The use of sustainable practices among farmers requires understanding the socioeconomic factors affecting their ability to implement these practices at farm-level [12]. This study determines the adoption of sustainable agricultural practices and the factors that are influencing farmers' adoption decisions.

2. METHODOLOGY

The study was carried out in Ogun State. The coordinate of the State is approximately between latitude 3° 30 N and 4° 30 N and longitude 6° 30 E and 7° 30 E [13]. The agro-ecological classification of Ogun State is rainforest and lies in humid tropical zone with high level plant and tree cover. The State has two distinct seasons with short dry season which lasts for four months from November to February. It lies within humid tropical agro-ecological zone. The area supported arable crops production with maize, cassava, legumes etc.

2.1 Sampling Procedure

The study was conducted among the maize farmers. This is due to the fact that maize is a major crop in the area and mostly grown among the majority of farmers in sole cropping and mixtures with other crops. The respondents were 196 maize farmers selected through a multistage sampling procedure. In the first stage purposive method was employed to select two agricultural zones (Abeokuta and Ilaro) based on agricultural development classification. In the second stage selection was based on random method. One agricultural block was selected from each of the zones after which four cells were randomly selected from each block. These blocks were Ilugun and Oke-odan. The selected cells were Kila, Odeda, Olodo and Ilugun. The total number of registered maize farmers in these cells was 1310. The selected cells in Oke-odan were Ilase, Ipokia, oke-odan and Ihunbo. The total number of registered maize farmers in these cells was 1260. The study made use of proportional sampling to select the farmers after the determination of sample size using a simplified formula provided by [14]. Primary data were collected with the use of structured questionnaires.

2.2 Analytical Techniques

The socio-demographic characteristics of the respondents were analyzed using descriptive statistics such as frequency count and percentages. A four point Likert scale was used to determine the adoption of SAPs among the respondents. This was graded as regularly = 4, Sometimes = 3, Rarely = 2 and Never = 1.

The mean score of respondents is computed as: 4+3+2+1=10; 10/4 = 2.4 cut off point.

Using the interval scale of 0.40, the upper cut-off point was determined as 2.5.00 + 0.50 =3.0; the lower limit as 2.5 – 0.50=2.0. On the basis of this, mean scores below 2.0 (i.e. MS < 2.0) was ranked non use of SAPs i.e. non adopter. Those between 2.0 – 3.0 were considered as moderate users of SAPs while mean scores that was greater than or equal to 3.0 (i.e. MS ≥ 3.50) was considered to be regular user of SAPs approach.

Multivariate probit model was used to identify factors influencing the adoption of SAP among farmers based on the fact that a farmer could be found with a mix of sustainable agricultural practices. These practices could be adopted simultaneously and/or sequentially as a complement or supplement to each other. Hence, the adoption decision is multivariate [7,8]. The use of univariate probit or logit models is appropriate when adoption decisions are inter-related since univariate models ignore the correlation in the error terms of adoption equations. The correlation arises because the same unobserved characteristics of farmers could influence the adoption decisions for different SAPs. Failure to capture such interdependence will lead to biased and inaccurate estimates.

According to [15], sustainable agricultural practices could be grouped into three categories. These are climate risk smart agriculture; crop protection and soil fertility management practices. The climate risk management practices included conservation agriculture, staggered planting and use of improved varieties. Integrated pest management was one of the crop protection option. The last category was soil fertility management practices which include inorganic fertilizers and use of organic manure. The expectation is that farmers would likely use SAPs that complement each other.

Table 1. Summary of independent variables included in the model

SN	Variables		Measurement
1	X_1	Age	Years
2	X_2	Education	Years of formal schooling
3	X_3	Household size	Number of person
4	X_4	Farm size	Hectare
5	X_5	Total annual income	Naira
6	X_6	Membership of social organization	Years of membership
7	X_7	Access to public extension	Number of contact
8	X_8	Experience in farming	Years of experience
9	X_9	Knowledge of water pollution	Dummy (yes =1 No=0)

Multivariate probit mode is specified below

$$Y_{ip}^{*} = \beta_p + X_{ip} + \varepsilon_{ip} \quad P = 1,2,3,\ldots\ldots..5$$

$$Y_{ip} = \begin{pmatrix} 1 & if\ Y_{ip}^{*} > 0 \\ 0 & otherwise \end{pmatrix}$$

Where,

Y_{ip}^{*} is a latent variable that captures the unobserved preferences associated with the choice of practice 'p'. This latent variable is assumed to be a linear combination of observed characteristics, Xip, and unobserved characteristics captured by the stochastic error term, εip. The vector of parameters to be estimated is denoted by βp. Given the latent nature of yip$*$, estimation is based on observable binary variables yip.

The error terms εip, p = 1,2……,4 is normally distributed with mean value of 0 and a variance-covariance matrix V, where V has 1 on the leading diagonal, and correlations ρjk = ρkj as off diagonal elements.

$$V = \begin{pmatrix} 1 & \rho_{12} & \rho_{13} & \rho_{14} & \rho_{1k} \\ \rho_{21} & 1 & \rho_{23} & \rho_{24} & \rho_{2k} \\ \rho_{31} & \rho_{32} & 1 & \rho_{34} & \rho_{3k} \\ \rho_{j1} & \rho_{j2} & \rho_{j3} & \rho_{j4} & 1 \end{pmatrix}$$

Where,

ρ (rho) denotes the pairwise correlation coefficient of m (ρ), the off-diagonal elements in the variance–covariance matrix of the equations become non-zero. Estimating ρ is not just to determine the correlation coefficient; it indicates a complementary relationship if the estimated value is positive and substitutes if it is negative.

Four sustainable practices were used these include use of improved variety (Y_1), agroforestry practice (Y_2), use of organic manure (Y_3), integrated pest management (Y_4). Independents variables included in the model are shown in Table 1.

3. RESULTS AND DISCUSSION

3.1 Socioeconomic Characteristics of the Farmers

The results in Table 2 revealed the socio-demographic characteristics of the farmers. The result showed that 69.89% were male while 30.10% were female. This indicates that male farmers dominated smallholder maize production in the study area. The average age of the farmers was 35 years this indicates that the respondents are youth and still in their active age group. This showed a greater participation of young farmers in farm production. Age is important in socio economic assessment associated with agriculture because it could be used to determine how active and productive a farmer could be [16]. The result of educational attainment showed that there is high literacy level among the farmers. Only 11.22% do not have access to formal education. The average farm size was 5.8 hectares. The farmers could be classified as small scale farmers. The average farm size is within the range of subsistence farmers who operate within 0.1-6.0 hectares as classified by [17]. The average household size was 5 members per household. The advantage of large household size is availability of family labour especially if household member fall within the working age group. The average years of experience in farm production was 20 years. This implied that farmers are familiar with agricultural production and must have accumulated experience related to farm business. More than three quarter (78.6%) of the farmers had contact with extension service during the farm production year under consideration in this study.

Table 2. Farmers socio-demographic characteristics

Variable	Frequency	Percentage
Sex		
Male	137	69.89
Female	59	30.10
Marital Status		
Married	151	77.04
Single	45	22.95
Age (years)		
21-30	70	35.71
31-40	66	33.67
41-50	52	26.53
51-60	7	3.57
>60	2	1.02
Mean	35	
Education		
No formal education	22	11.22
Primary education	8	4.08
Secondary education	93	47.45
Tertiary education	77	39.29
Farm size (hectare)		
1.1-5.0	96	48.97
5.1-10.0	45	22.96
>10	55	28.06
Mean	5.8	
Experience (years)		
1-10	70	35.71
11-20	76	38.78
>20	50	25.51
Mean	14	
Household size		
1-5	76	38.78
6-10	118	60.20
>10	2	1.02
Mean	5	
Extension contact		
Yes	153	78.06
No	43	21.94
Total	**196**	**100.00**

Table 3. Rate of adoption of sustainable agricultural practices among farmers

S/No	Technologies	Frequency*	Percentage	Rank
1	Improved variety	187	95.41	1
2	Agroforestry	168	85.71	2
3	Use of organic manure	81	41.33	4
4	Integrated pest management	164	83.67	3

** Multiple responses were allowed*

3.2 Adoption of Sustainable Agricultural Practices

The results presented in Table 3 showed the adoption of sustainable agricultural practices among the respondents. It was revealed that the use of improved variety was adopted by 95.41% and this was rank first among the practices adopted by the farmers. This could be due to the importance attached to increased productivity as a result of improved variety. Agroforestry as a sustainable practice was ranked second. This was adopted by 85.71% of the respondents. Agroforestry is the combination of tree and crops on the same plot. It is a sustainable land management option to achieve productivity of

crop yield and mitigate climate change [18]. In their study of [19] on farmers' participation in agroforestry noted that the higher involvement of farmers in agroforestry was due to the fact that it is a sustainable form of farming practice for achieving land sustainability. The system has the potential for increasing food production, and enhancing the household income. Those that adopted the use of organic manure constitute 83.67%. Larger adopters of organic manure application indicate that farmers are knowledgeable about the importance of this sustainable form of agriculture. Organic manure is a soil amendment strategy that improves the physical properties and soil erosion [20]. Integrated pest management (IPM) was adopted by 41.33% and this was the least among the sustainable farming options presented to the farmers. The low adoption rate obtained in the use of IPM in this study is similar to [21]'s assertion that there is poor adoption of integrated pest management among farmers in developing countries.

3.3 Extent of Adoption of Sustainable Agricultural Practices

The result presented in Table 4 show the extent to which farmers are practicing sustainable agricultural practices it was revealed that 94.39% of the farmers were regularly use improved variety. This implied that farmers were aware of the importance of improved variety and attached greater value to its usage. Those that never used improved variety constitute 3.06. More than two third (72.45%) of the farmers use were regularly practicing agroforestry while 14.80% were never practiced agroforestry. Adoption of agroforestry by 72.45% of the farmers is a good indication to achieve multiple land use and enhance increased productivity. The use of organic manure on regular basis was adopted by 39.28%. Those who were never use organic manure constitute 5.6%. Regular use of IPM was done by 20.92% while 62.76% sometimes use IPM. Those who were never use IPM were 12.75%. The respondent who have never practice any of the selected sustainable agricultural practices could be regarded as non adopter.

3.4 Factors Influencing Adoption of Sustainable Practices among Farmers

The results presented in Table 5 showed the determinants of sustainable agricultural practices among the farmers in the study area. The likelihood ratio test which represent the overall correlation error terms was 135.47 and this value was significant at 1% level of probability. This indicates that the error terms in the specified model are correlated. The significant of this is that the application of multivariate probit model was appropriate to identify the factors influencing the adoption of sustainable agricultural practices. The estimated coefficient of age had significant relationship with all the practices. It was positive with adoption of improved variety while it was negatively related to adoption agroforestry, organic manure and IPM. This implied that there is probability that the older farmers would adopt improved variety. Adoption of agroforestry, organic manure and IPM was common among the younger farmers. This result was similar to what was obtained by [15] who reported that young farmers are more likely to adopt conservation agriculture but as farmers become too old the likelihood to adopt this technology falls. The negative coefficient of age with agroforestry is not surprising because older farmers may not be willing to involve in tree planting due to long gestation period of tree and harvesting cannot be achieved in short period of time. The coefficients of education were found exerting positive influence on all the sustainable practices except the use of improved variety. Membership of social organization was influencing all the sustainable practices. This variable was positive indicating that there is probability that with increase years of membership there will be increase in the rate of adoption.

The rho values which indicate complementarities and substitutes of the sustainable practices revealed that there is complementarity

Table 4. Extent of adoption of sustainable agricultural practices

Sustainable practices	Regularly	Sometimes	Rarely	Never	Weighted score
Use of improved variety	185(94.39)	2(1.02)	3(1.53)	6(3.06)	3.9
Agroforestry practice	142(72.45)	23(11.73)	2(1.02)	29(14.80)	3.4
Use of Organic manure	77(39.28)	5(2.55)	103(52.55)	11(5.6)	2.7
IPM	41(20.92)	123(62.76)	7(3.57)	25(12.75)	2.9

Figures in parentheses are percentages

Table 5. Multivariate probit model of estimated coefficients

Variables	Improved variety	Agroforestry	Organic manure	IPM
Constant	6.328 (5.335)	0.900(0.976)	1.690***(0.531)	1.435(0.829)
Age	0.325** (0.146)	-0.001**(0.036)	-0.037*(0.021)	-0.102***(0.029)
Education	0.569 (1.546)	0.085(0.159)	0.216**(0.090)	0.985***(0.191)
Farm size	0.091 (1.102)	0.251**(0.124)	0.153***(0.031)	0.027(0.068)
Farming experience	-0.128 (0.941)	-0.156**(0.066)	-0.045**(0.021)	0.029***(0.038)
Household size	-0.787 (0.660)	-0.032(0.147)	0.202***(0.069)	0.311***(0.119)
Membership of association	1.337** (0.639)	0.627***(0.166)	0.108***(0.042)	0.341***(0.106)
	Rho1	**Rho2**	**Rho3**	**Rho4**
Rho2	-0.35			
Rho3	-0.33	0.041		
Rho4	-0.32	0.002	0.55	
Extension contact	3.009 (2.107)	0.900(0.976)	0.090(0.107)	3.333(104.72)
Wald chi2	135.47***			
Loglikehood	-165.19			

**=p<0.10, **=p<0.05, *** =p<0.01*

(positive correlation) and substitutability (negative correlation) between different practices. The result supports the assumption of interdependence between the different practices. The highest positive correlation (0.55) was between the use of organic manure and IPM. Application of manure will raise the fertility of the soil while IPM will protect the crop from pest infestation which will result to better crop yield.

4. CONCLUSION AND RECOMMENDATIONS

The study revealed that adoption of sustainable agricultural practices among smallholder farmers in the study depends on the socioeconomic characteristics. These include age, education, farm size, experience in farm production and membership of social organization. The negative estimated parameter for age indicated that young farmers are more likely to adopt agroforestry practices, use of organic manure and IPM as sustainable framing practice option to increase productivity and reduce environmental vulnerability to ecological problems. This suggests that campaign for adoption of sustainable agricultural practices should target young farmers. However, this is not to discriminate older farmers in the sustainable agricultural policy agenda. It was established from this study that there is complementarities between adoptions of sustainable agricultural practices. In some cases substitute effects were observed. The implication of this is that policy changes that affect adoption of a given practice can have spillover effect on the other. Hence, extension services and promotion agenda should emphasize these effects between different practices to enhance farmers' choice.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Oyewole SO, Ojeleye OA. Factors influencing the use of improved farm practices among small-scale farmers in Kano State of Nigeria. Net Journal of Agricultural Science. 2015;3(1):1-4.
2. Olawuyi SO, Hardman M. Effect of adoption of alternative conservation agricultural practices on smallholder farmers' production output in South-West Nigeria. Cogent Social Sciences. 2019;5(1):1588447.
3. Aina PO. Conservation tillage for sustainable agricultural productivity. Soil Tillage Research. 2011;20:165-186.
4. Kughur PG, Katikpo G, Kuza Y. Adoption of sustainable agricultural practices by farmers in Otukpo Local Government Area of Benue State, Nigeria. World Journal of Pharmaceutical and Life Sciences. 2015;1(3):92-99.
5. FAO. The state of food security and nutrition in the world. Building Climate Resilience for Food Security and Nutrition, Rome, Italy; 2018.
6. Kassie M, Jaleta M, Shiferaw B, Mmbando F, Mekuria M. Adoption of interrelated sustainable agricultural practices in smallholder systems. Evidence from rural

Tanzania. Technological Forecasting and Social Change. 2013;80:525-540.
7. Teklewold H, Kassie M, Shiferaw B, Köhlin G. Cropping system diversification, conservation tillage and modern seed adoption in Ethiopia: Impacts on household income, agrochemical use and demand for labor. Ecological Economics. 2013;93:85-93.
8. Kassie M, Teklewold H, Jaleta M, Marenya P, Erenstein O. Understanding the adoption of a portfolio of sustainable intensification practices in Eastern and Southern Africa. Land Use Policy. 2015;42: 400-411.
9. Vanlauwe B, Coyne D, Gockowski J, Hauser S, Huising J, Masso C, Nziguheba G, Schut M, van Asten P. Sustainable intensification and the African smallholder farmer. Current Opinion in Environmental Sustainability. 2014;8:15-22.
10. Ngwira AR, Johnsen FH, Aune JB, Mekuria M, Thierfelder C. Adoption and extent of conservation agriculture practices among smallholder farmers in Malawi. Journal of Soil and Water Conservation. 2014;69(2):107-119.
11. Anderson JA, D'Souza S. Farm adoption claims to understanding farmers and context: A literature review of conservation agriculture adoption among smallholder farmers in Southern Africa. Agriculture, Ecosystems and Environment. 2014;187: 116-132.
12. Mutyasira V, Hoag D, Pandel D. The adoption of sustainable agricultural practices by smallholder farmers in Ethiopia highlands: An integrative approach. Cogent Food and Agriculture. 2018;4(1):1552439.
13. Ambali OI, Adegbite DA, Ayinde IA, Awotide DO. Analysis of production efficiency of food crop farmers in Ogun State, Nigeria. ARPN Journal of Agricultural and Biological Science. 2013;7(9):680-688.
14. Kabatesi I, Mbabazi M. Assessment of standard of living indicators in measuring household poverty in Rwanda: Evidence of rutunga sector. European Journal of Business and Social Sciences. 2016;5(6): 265-278.
15. Murendo C, Gwara S, Mpofu N, Pedzisa T, Mazvimavi K, Chivenge P. The adoption of a portfolio of sustainable agricultural practices by smallholder farmers in Zimbabwe. Invited Paper Presented at the 5th International Conference of the African Association of Agricultural Economists, September 23-26; 2016.
16. Amaza P, Abdoulaye T, Kwaghe P, Tegbasu A. Changes in household food security and poverty status in PROSAB area of Southern Borno State, Nigeria. International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria. 2009;40.
17. Ojuekaiye EO. Economic analysis of cassava production in three local Government Area of Kogi State. Unpublished M.Sc Thesis, Department of Agricultural Economics and Rural Sociology, Ahmadu Bello University, Zaria, Nigeria; 2001.
18. Adepoju AO, Akinyemi O, Oyewole SO, David E. Agroforestry in a diversified Nigerian economy. Proceedings of the 19th Annual Conference of the Nigerian Association of Agricultural Economists (NAAE), College of Forest Mechanization, Kaduna on 15-18 October; 2018.
19. Oyewole SO, Dahunsi OM, Akintola AL. Socio-economic assessment of farmers' participation in agroforestry system in Ekiti State, Nigeria. Net Journal of Agricultural Science. 2015;3(4):99-103.
20. Mgbenka RN, Onwubuya EA, Ezeano CT. Organic farming in Nigeria: Need for popularization and policy. World Journal of Agricultural Sciences. 2015;11(6):346-355.
21. Parsaa S, Morse S, Bonifacio A, Chancellor TCB, Condor B, Crespo-Pérez V, Hobbs SLA, Kroschel J, Ba MN, Rebaudo, Sherwood G, Vanekm SJ, Faye E, Herrera MA, Dangle O. Obstacles to integrated pest management adoption in developing countries. Proceedings of the National Academy of Sciences; 2014.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/57953